UNITED STATES PATENT AND TRADEMARK OFFICE



BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HORT SULZBACH, THOMAS HUVER,
HANS-JOSEF THOMAS, and VINCENZO FOGLIANISI

Appeal No. 2004-2073
Application No. 09/743,125

ON BRIEF

Before OWENS, WALTZ, and DELMENDO, Administrative Patent Judges.
WALTZ, Administrative Patent Judge.

**DECISION ON APPEAL**

This is a decision on an appeal from the primary examiner's final rejection of claims 8 through 20, which are the only claims pending in this application. We have jurisdiction pursuant to 35 U.S.C. § 134.

According to appellants, the invention is directed to a process for producing self-dispersing, curable, epoxy resins,

where the process comprises a first step of reacting one or more α,β-unsaturated carboxylic acid esters with one or more aminopolyalkylene oxide compounds, followed by the second step of reacting the product of the first step with one or more polyepoxides (Brief, page 4).[1] Appellants state that the claims do not stand or fall together and present reasonably specific, substantive arguments for the separate patentability of two groups of claims (claim 14 as one group and the remainder of the claims on appeal as one group). Accordingly, pursuant to the provisions of 37 CFR § 1.192(c)(7)(2000), we select claim 8 from the first group of claims, as well as claim 14 as the second group, and limit our consideration to these claims. A copy of representative independent claim 8 is attached as an Appendix to this decision.

The examiner relies upon Scherr et al. (Scherr), U.S. Patent No. 5,641,855, issued on June 24, 1997, as the sole evidence of obviousness. Accordingly, the claims on appeal stand rejected

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[1]We note that neither the examiner nor appellants have commented on claims 16-20, which are directed to the product produced by the process of claims 8, 9 and 11, as well as the aqueous dispersions of these products. In the event of further or continuing prosecution of this claimed subject matter, the examiner should separately consider the patentability of product-by-process claims, due to the lesser burden of proof necessary to establish a *prima facie* case of unpatentability. *See In re Fessman*, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974).

under 35 U.S.C. § 103(a) as unpatentable over Scherr (Answer, page 3). We *affirm* the examiner's rejection essentially for the reasons stated in the Answer, as well as those reasons set forth below.

**OPINION**

The examiner finds that Scherr discloses a process for preparing water-soluble condensation products comprising reacting a polyetheramine or a polyetherpolyamine with a monoethylenically unsaturated carboxylic acid ester, followed by reacting this product with bis-glycidyl ethers (Answer, page 3, citations to Scherr omitted). The examiner also finds that Scherr teaches that the compounds (a) and (b)(i.e., the polyetheramine and unsaturated carboxylic acid ester) are used in such a ratio that "from 20 to 99% ... of the primary and secondary amino groups of (a) survive unchanged ...". Col. 6, ll. 5-9. The examiner "converts" this finding from Scherr to an equivalent ratio of reactive hydrogen atoms to double bonds of from 1.20:1 to 1.99:1 (Answer, page 3). Similarly, the examiner "converts" the teaching from Scherr regarding the ratio of (c) to (a) to an equivalent ratio of 20:1 (*id.*, citing col. 6, ll. 8-11).

The examiner recognizes that the claimed aminopolyalkylene oxide is "not exemplified" but finds that the polyetheramine or

polyetherpolyamine of Scherr is generic to or encompasses this reactant (Answer, page 3). From these findings, the examiner concludes that it would have been obvious to one of ordinary skill in the art to use "equivalent reactants" to react with the monoethylenically unsaturated carboxylic acid ester in the process of Scherr (*id.*).

Appellants argue that Scherr makes no mention of C=C double bond equivalents, that component (b) of Scherr includes other choices than compounds with double bonds, and there is no indication in Scherr that any particular ratio of reactive hydrogen atoms to α,β double bonds should be used (Brief, page 7).

Appellants' arguments are not persuasive. We note that Scherr discloses many choices for component (b) that contain an α,β C=C double bond (col. 1, l. 66-col. 2, l. 1), with the teaching that these compounds react with group (a) compounds in the manner of a Michael addition (col. 6, ll. 19-22; see the specification, sentence bridging pages 5-6), and lists at least one such unsaturated ester that is disclosed and claimed by appellants (dimethyl maleate at col. 4, l. 23; see claim 10 on appeal).

We agree with appellants that the examiner has not provided sufficient facts to support the calculations that "converts" the ratio of primary and secondary amino groups of (a) that survive unchanged into "equivalent ratios" of reactive hydrogen atoms to α,β C=C double bonds (Answer, page 3; see the Brief, page 8, and Reply Brief, pages 2-6).[2] However, we do not agree with appellants' argument that there is no indication in Scherr that any particular ratio of reactive hydrogen atoms to α,β C=C double bonds should be used (Brief, page 7). As admitted by appellants, the expression "equivalent ratio" is familiar to the expert and is directly related to the amounts of reactants (moles) needed to achieve complete reaction, or to drive the reaction to completion (specification, page 5). As found by the examiner (Answer, page 3), Scherr specifically teaches that the "components (a), (b) and (c) can be used in any desired ratio" (col. 6, ll. 4-5). Furthermore, Scherr teaches desired ratios of all the reactants, although not in terms of "equivalent ratios" (col. 6, ll. 5-12). Additionally, one of ordinary skill in this art would have recognized that an excess amount of the

[2]We note that appellants have not presented any arguments concerning the examiner's calculations or conversion to "equivalent ratios" for the teaching of Scherr regarding the ratio of compound (c) to compound (a)(Answer, page 3, citing Scherr, col. 6, ll. 8-11).

polyetheramine reactant was desired by Scherr, since a large amount of reactive amino groups of (a) "survive unchanged," i.e., do not react with the double bond in component (b)(*id.*). Finally, the law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. These cases have consistently held that in such a situation appellants must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range. *See In re Woodruff,* 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). No such evidence has been presented on this record (Answer, page 6).

Appellants argue that Scherr fails to teach or suggest the claimed equivalent ratio recited in claim 14 on appeal (Brief, page 9). This argument is also not persuasive for the reasons discussed above.

For the foregoing reasons and those stated in the Answer, we determine that the examiner has established a *prima facie* case of obviousness in view of the reference evidence. Based on the totality of the record, including due consideration of appellants' arguments, we determine that the preponderance of evidence weighs most heavily in favor of obviousness within the

meaning of section 103(a). Accordingly, we affirm the examiner's rejection of the claims on appeal under 35 U.S.C. § 103(a) over Scherr.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

**AFFIRMED**

Terry J. Owens
Terry J. Owens
Administrative Patent Judge )

Thomas A. Waltz
Thomas A. Waltz
Administrative Patent Judge ) BOARD OF PATENT APPEALS AND INTERFERENCES

Romulo H. Delmendo
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**APPENDIX**

8. A process for producing self-dispersing, curable, epoxy resins, the process comprising:

(i) reacting (a) one or more α,β-unsaturated carboxylic acid esters of the general formula (I),

$$R^2R^3C=C(R^4)COOR^1 \qquad (I),$$

with (b) one or more aminopolyalkylene oxide compounds having at least one aminonitrogen atom with one or more reactive hydrogen atoms, wherein $R^1$ represents a hydrocarbon radical having up to 15 carbon atoms, wherein $R^2$, $R^3$, and $R^4$ each independently represents a substituent selected from the group consisting of hydrogen, hydrocarbon radicals having up to 20 carbon atoms, and $-(CH_2)_n-COOR^1$, wherein $R^1$ is as defined above and n represents a number of from 0 to 10, and wherein (a) and (b) are present in quantities such that the equivalent ratio of the reactive hydrogen atoms in (b) to the α,β C=C double bonds in (a) is from 10:1 to 1:10, to form an intermediate product Z1; and

(ii) reacting the intermediate product Z1 with (c) one or more polyepoxides having a number of oxirane rings, wherein the intermediate product Z1 and the one or more polyepoxides are present in quantities such that the equivalent ratio of the oxirane rings to the reactive hydrogen atoms in (b) is from 100:1 to 1.5:1.